

## REMARKS

This reply encompasses a bona fide attempt to address the rejections raised by the Examiner and presents amendments as well as reasons why the applicants believe that the claimed invention is novel and unobvious over the closest prior art of record, thereby placing the present application in a condition for allowance.

### *Regarding Claim Status*

Claims 1-28 were examined. Claims 1,2 and 4-28 were rejected. Claim 3 has been objected to as being dependent on a rejected base claim, but was indicated to be allowable. Applicants thank the Examiner for pointing out allowable subject matter. Claims 1 and 2 are cancelled herein. Claims 3-5, 8-17, and 28 are amended herein. No new matter is introduced by these amendments.

By this Amendment, claims 3-28 are pending.

### *Regarding 35 U.S.C. § 112 Rejections*

Claims 5-7 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner has pointed out that the recitation “further comprising a mixing chamber” in line 3 of claim 5 is indefinite, since a mixing chamber was already recited in claim 1. Claim 5 has been amended herein to address this rejection.

*Regarding 35 U.S.C. § 102 Rejections*

Claims 1, 2, and 15 were rejected under 35 U.S.C. § 102(e) as being anticipated by Ahn et al. Claims 1 and 2 are cancelled herein, rendering the rejection moot. Claim 15 has been amended to depend from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that amended claim 15 is novel over Ahn et al and should be allowed.

*Regarding 35 U.S.C. § 103 Rejections*

Claims 1, 2, 4 and 14 were rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Paul et al. Claims 1 and 2 are cancelled herein, rendering the rejection moot. Claims 4 and 14 have been amended herein to depend from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that amended claims 4 and 14 are novel and unobvious over Paul et al and should be allowed.

Claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Paul et al in view of Parce (US 6,012,902). Claim 5 has been amended herein to depend from amended claim 3, which has been indicated to be allowable. Claim 6 depends from amended claim 5. It is therefore respectfully submitted that amended claim 5 and claim 6 are patentable over Paul et al in combination with Parce and should be allowed.

Claims 8-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al in view of Arnold et al and over Paul et al in view of Arnold et al. Claims 8-11 have been amended herein to depend from amended claim 3, which has been indicated to be allowable.

It is therefore respectfully submitted that amended claims 8-11 are patentable over Ahn et al in combination with Arnold et al, and Paul et al in combination with Arnold et al, and should be allowed.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Paul et al and Parce et al, and further in view of Arnold et al. Claim 7 depends from amended claim 5, which depends from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that claim 7 is patentable over the combination of Paul et al, Parce et al, and Arnold et al and should be allowed.

Claims 8, 9, 11, and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al in view of Manz et al and over Paul et al in view of Manz et al. Claims 8, 9, 11, and 12 have been amended herein to depend from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that amended claims 8, 9, 11 and 12 are patentable over Ahn et al in combination with Manz et al, and Paul et al in combination with Manz et al, and should be allowed.

Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al. Claim 10 has been amended herein to depend from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that amended claim 10 is patentable over Ahn et al and should be allowed.

Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al in view of Wilding et al, and Paul et al in view of Wilding et al. Claim 13 has been amended herein

to depend from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that amended claim 13 is patentable over Ahn et al in combination with Wilding et al, and Paul et al in combination of Wilding et al, and should be allowed.

Claims 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al in view of Yager et al, and Paul et al in view of Yager et al. Claim 16 has been amended herein to depend from amended claim 3, which has been indicated to be allowable. It is therefore respectfully submitted that amended claim 16 is patentable over Ahn et al in combination with Yager et al, and Paul et al in combination of Yager et al, and should be allowed.

Claims 17-24, 26, and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al in view of Arnold et al. With regard to claim 17, the Examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Ahn et al with the electroosmotic pump of Arnold et al by adding electrodes to the side channels of Ahn. The electrodes would serve to provide a DC current to induce electroosmotic fluid flow through the device according to Ahn et al (i.e. from reservoirs 20 and 24 to outlet 28). Claim 17 has been amended herein to include a structural limitation to a voltage source that applies an AC field via the side channel ports, thus distinguishing the structure according to the present invention from a structure according to Ahn et al as modified by Arnold et al. It is therefore respectfully submitted that amended claim 17 is patentable over Ahn et al in combination with Arnold et al and should be allowed. As claims 18-24, 26, and amended claim 28 are dependent on amended claim 17, applicants respectfully submit that claims 18-24, 26, and amended claim 28 should also be allowed.

Claim 25 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn et al and Arnold et al in further view of Paul et al. Claim 25 is dependent on amended claim 17. As amended claim 17 is submitted to be patentable, given the reasons in the previous paragraph, applicants respectfully submit that claim 25 is patentable over Ahn et al in combination with Arnold et al and Paul et al and should therefore be allowed.

Claim 27 was rejected 35 U.S.C. § 103(a) as being unpatentable over Ahn et al and Arnold et al in further view of Yager et al. Claim 27 is dependent on amended claim 17. As amended claim 17 is submitted to be patentable, given the reasons stated above, applicants respectfully submit that claim 27 is patentable over Ahn et al in combination with Arnold et al and Yager et al and should therefore be allowed.

Claims 17-19, 25, 26, and 28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Paul et al in view of Parce. The Examiner contends that it would have been obvious to substitute an electroosmotic pumping structure as taught by Parce for the pump structure (i.e. electrodes 130 and 140) with the structure of Parce. Applicants respectfully submit that this is not the case. Parce teaches “a micropump that uses electroosmotic pumping of fluid in one channel or region to generate a pressure based flow of material in a connected channel, where the connected channel has substantially no electroosmotic flow generated” (see abstract). Referring to Figure 1, and as described in column 6, lines 18-26, “a voltage gradient is applied across the length of the second channel portion via electrodes disposed in electrical contact with those ends, whereupon the voltage gradient causes electroosmotic flow of fluid within the second channel portion. The pressure developed from this electroosmotic flow is translated through the channel junction to the first channel portion. **In accordance with the**

**present invention, the first channel portion produces substantially no electroosmotic flow.”** Figure 2 is a modification of the invention, using a side port instead of directly inserting the electrodes, but again, its purpose is to supply pressure to a first channel in which fluid can flow due to pressure rather than through electroosmotic means. Thus, the invention as set forth in Parce is useful in situations “where the applications for which the pump is to be used prohibits the application of electric fields to the channel in which flow is desired, or where pressure based flow is particularly desirable” (page 3, lines 11-15). In contrast, Paul relies on the application of an electric field to the channel for the invention to function. “The presence of the applied electric field, such as that produced by the pairs of spaced electrodes 130 and 140, induces a force on the liquid double layer that causes motion of the liquids contained in chamber 110 along the chamber walls”, (column 3, lines 8-12). Applicants submit that the pump as set forth in Parce would not accomplish this. Thus, there would have been no motivation for one of ordinary skill in the art to combine the pump of Parce with the mixer of Paul et al. Therefore, applicants respectfully submit that amended claim 17 is patentable over Paul et al in combination with Parce and should be allowed. As claims 18, 19, 25, 26, and amended claim 28 are dependent on amended claim 17, applicants respectfully submit that claims 18, 19, 25, 26, and amended claim 28 should also be allowed.

Claims 21-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Paul et al and Parce, and in further view of Manz et al. Claims 21-24 are dependent on amended claim 17. As amended claim 17 is submitted to be patentable, given the reasons in the previous paragraph, applicants respectfully submit that claims 21-24 are patentable over Paul et al in combination with Parce and Manz et al and should therefore be allowed.

Claim 27 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Paul et al and Parce, and in further view of Yager et al. Claim 27 is dependent on amended claim 17. As amended claim 17 is submitted to be patentable, given the reasons set forth above, applicants respectfully submit that claim 27 is patentable over Paule et al in combination with Parce and Yager et al and should therefore be allowed.

*Regarding Allowable Subject Matter*

Claim 3 was objected to as being dependent on a rejected base claim, but was indicated to be allowable. Claim 3 has been amended to include all of the limitations of claims 1 and claim 2. Therefore, applicants respectfully submit that claim 3 should be allowed.

*Conclusion*

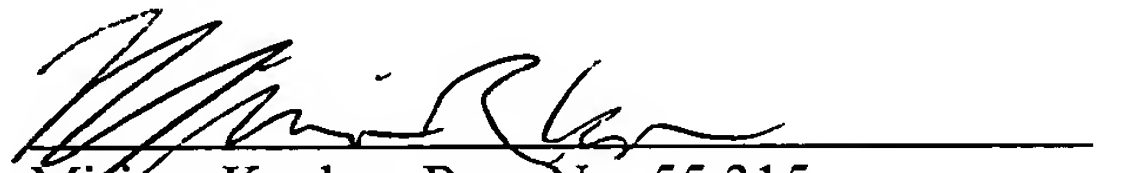
For the foregoing reasons, it is respectfully submitted that the invention as set forth in amended independent claims 3 and 17, amended dependent claims 4, 4, 8-17 and 28, and dependent claims 6, 7, and 18-27 recites subject matter that is novel, under 35 U.S.C. § 102(e) over Ahn et al and Paul et al, and is patentably distinct, under 35 U.S.C. § 103(a), from Paul et al, Paul et al in combination with Parce, Ahn et al in combination with Arnold et al, Paul et al in combination with Arnold et al, Paul et al in combination with Parce and Arnold et al, Ahn et al in combination with Manz et al, Paul et al in combination with Manz et al, Ahn et al, Ahn et al in combination with Wilding et al, Paul et al in combination with Wilding et al, Ahn et al in combination with Yager et al, Paul et al in combination with Yager et al, Ahn et al in combination with Arnold et al and Paul et al, Ahn et al in combination with Arnold et al and Tager et al, Paul et al in combination with Parce and Manz et al, and Paul et al in combination with Parce and Yager. Accordingly, amended claims 3



and 17 are submitted to be patentable and therefore should be allowed. Claims 4-16, and 18-28 are submitted to be patentable as they are dependent on amended independent claims 3 and 17, respectively.

This Reply is submitted to be complete and proper in that it places the present application in a condition for allowance without adding new matter. Favorable consideration and a Notice of Allowance of all pending claims 3-28 are therefore respectfully solicited.

Respectfully submitted,



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